L. L. NARAYANA* & Digamber RAO*: Contributions to the floral anatomy of Humiriaceae 4

L. L. ナラヤナ*・D. ラオ*: Humiriaceae の花部解剖学的研究 4

Earlier, four papers have appeared on the floral anatomy and Humiriaceae (Rao and Narayana, 1965; Narayana & Rao, 1969, 1973a, 1973b) and the present paper, the fourth in the series deals with the floral morphology and vascular anatomy of *Sacoglottis gabonensis* Urb., and *S. guianensis* Benth.

Morphology of the flower The flowers are pedicellate, pentacyclic, pentamerous, heterochlamydeous, regular, bisexual and hypogynous (Figs. 6, 10, 16, 21, 22, 24). The sepals show quincuncial aestivation (Figs. 5, 6, 22); they are free in *S. gabonensis* (Figs. 4–6) and basally connate in *S. guianensis* (Figs. 21, 22). The free petals show quincuncial aestivation in *S. guianensis* (Figs. 22–25, 28) and contorted arrangement in *S. gabonensis* (Figs. 9, 10, 14, 15). The androecium consists of ten stamens of two different heights, the antipetalous being shorter (Figs. 14, 15, 16, 28). The stamens show basal connation. There are two unilocular thecae for each anther situated at the base on the outside (Figs. 14–16, 28). The anthers are dorsifixed and introrse (Figs. 14–16, 28). The fleshy, vascularised connective extends beyond the loculi in the form of a massive appendage (Fig. 16). The 5-carpellary syncarpous ovary is 5-locular at the base, with one ovule in each antisepalous loculus (Figs. 9–12, 23–27). The ovary becomes unilocular towards the top (Fig. 13). The style is semisolid and ends in five stigmatic lobes (Fig. 16). The star shaped stylar canal is lined by transmitting tissue (Figs. 14–16, 28). There is an intrastaminal, non-vascularised disc adnate to the base of the ovary (Figs. 7, 8, 16, 23, 24). It is annular and membranaceous in *Sacoglottis gabonensis* (Fig. 8) and lobed in *S. guianensis* (Fig. 24).

Floral anatomy The pedicel shows a ring of discrete bundles (Figs.

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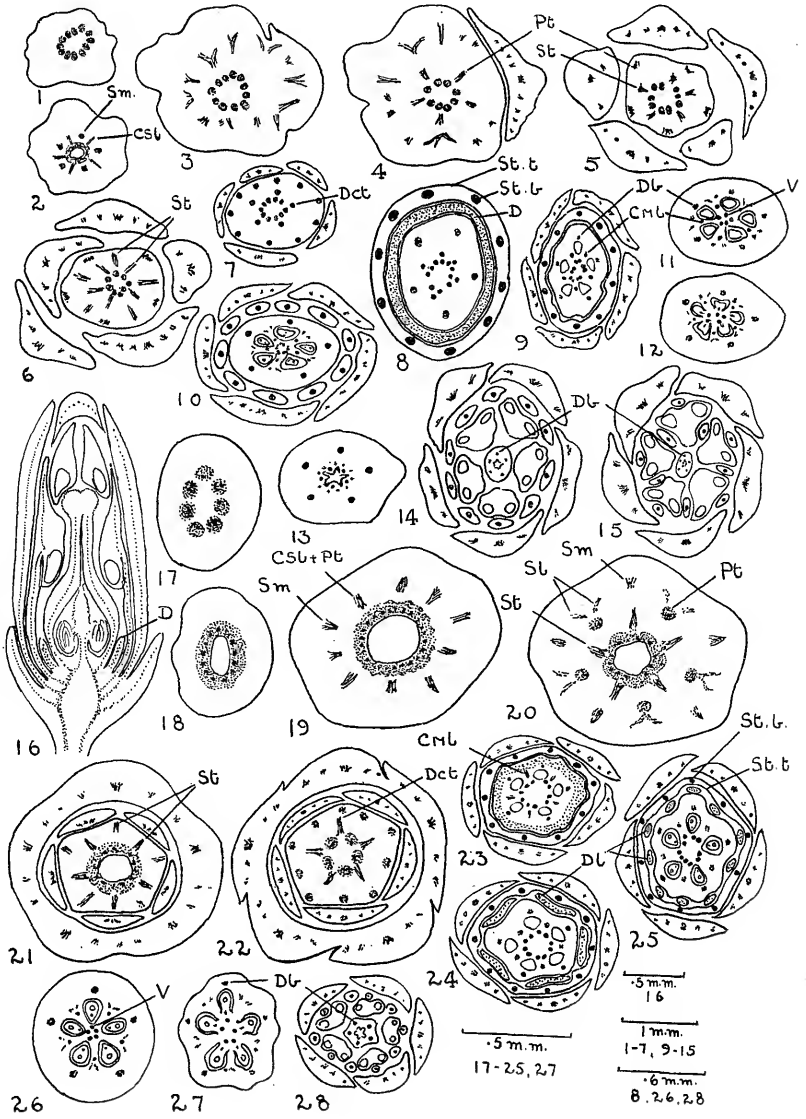
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1 m.m.
1-7, 9-15
·5 m.m.
17-25, 27
·6 m.m.
8, 26, 28

1, 17). In *S. gabonensis* the sepal midrib and common sepal leteral traces arise in two alternating whoris (Figs. 2, 3). In *S. guianensis* there is adnation between common sepal lateral traces and petal midribs (Figs. 19, 20). The common sepal-lateral—petal midrib-traces divide tangentially demarcating the common sepal laterals to the outside and the petal midribs towards the inside (Fig. 20). The former divide radially and form the lateral traces of adjacent sepals (Figs. 20, 21). In *S. gabonensis* the petal traces arise independently (Fig. 4).

After the organization of perianth supply, the antisepalous and antipetalous staminal traces arise in two close alternating whorls (Figs. 5, 6, 20, 21). These diverge out and enter the base of the staminal tube (Figs. 7, 8, 23). The intrastaminal disc is adnate to the base of the ovary and is not vascularised (Figs. 8, 16, 23, 24).

After the staminal supply is given off, five dorsal carpellary traces and as many common median lateral traces arise along the sepal and petal radii respectively (Figs. 7, 8, 22, 23). Branches arising from the latter supply the ovary wall (Figs. 10, 11, 26, 27). The dorsal carpellary bundles extend into the style and finally terminate near the base of the stigma (Fig. 16). The remaining stele organises into five pairs of bundles along the septal radii (Figs. 8, 9, 23). They fuse in pairs and come to lie opposite the loculi; these form the ventral bundles (Figs. 9–11, 23–26). After giving off the ovular traces they extend upto the top of the ovary (Figs. 12, 13, 16, 27).

Summary and conclusions The pedicellate flower is pentacyclic, pentamerous, regular, bisexual and hypogynous. The sepals are 3-traced and show basal connation. There is connation between the lateral traces of adjacent sepals in *S. gabonensis* while in *S. guianensis* there is adnation between petal medians and common sepal lateral traces. The single traced

Figs. 1-15. *Sacoglottis gabonensis*. Figs. 16-28. *S. guianensis*. 16. Semidiagrammatic L. S. of flower showing the course of the vascular bundles in the different floral parts. 1-15, 17-28. Serial transverse sections of flowers showing the origin and distribution of the traces to the different floral parts. For explanation see text. Sm: sepal midribs. Csl: common sepal laterals. Pt: petal traces. St: staminal traces. Dct: dorsal carpellary traces. St. t.: staminal tube. St. b.: staminal bundle. Db: dorsal bundle. CML: common median laterals. V: ventrals. D: disc. Dl: disc lobes. Csl+Pt: common sepal lateral+petal traces. Sl: sepal laterals.

petals are contorted in *S. gabonensis* and quincuncial in *S. guianensis*. The androecium consisting of ten stamens is monadelphous and the stamens are of two different heights, where the antipetalous being shorter. Vascular anatomy shows that the androecium is diplostemonous. The non-vascularised, intrastaminal disc is adnate to the base of the ovary. The carpels are 5-traced. Placentation is axile. The semisolid style is lined by transmitting tissue and is vascularised by the dorsal bundles.

Acknowledgements We are thankful to Prof. U. B. Sachidananda Swami, for his interest. Our sincere thanks are due to Dr. K. Subramanyam, for his valuable suggestions. Grateful thanks are also due to the Director of Forest Research, Ibadan, for kindly sending the material of *Sacoglottis gabonensis* Urb., to the Director, Botanic Gardens, Rio de Janeiro; and to Dr. J.C. Lindeman, Holland, for the material of *Sacoglottis guianensis* Benth.

Literature cited

Narayana, L. L. & Rao, D. 1969. Contributions to the floral anatomy of Humiriaceae 1. J. Jap. Bot. 44(11): 238–335. —— 1973a. 2. l. c. 48(5): 143–146. —— 1973b. 3. l. c. 48(8): 242–246. Rao, D. & Narayana, L. L. 1965. Vascular Anatomy of Humiriaceae. Curr. Sci. 34(12): 383–384.

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著者は本誌に連載された同表題の論文 1, 2, 3 報でそれぞれ Humiriaceae に属する *Vantanea* (3 spp.), *Humiriastrum* (1 sp.), *Humiria* (1 sp.) を報告したが，今回は *Sacoglottis gabonensis* Urb. および *S. guianensis* Benth. の研究結果を報告した。これらの花部諸器官の配列，融合状態の程度その他，およびそれらへの管束の走向を連続横断切片によって研究した。この 2 種で異っている点を特に挙げると，1) 前者では花弁が回旋状，後者では覆瓦状であること，2) 前者では萼片の側管束が隣接する萼片のそれと合着するのに対して，後者では花弁の中央管束と萼片の共通側管束との合着が起っていることである。